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Date: February 8, 2000

Subj: Public commentary Yucca Mtn EIS draft report

MESSAGE: Please accept this submission as my written commentary on the Yucca Mountain draft environmental impact statement. These remarks extend my public testimony given at the DOE hearing in St. Louis on January 20, 2000.

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February 8, 2000

Response to the U.S. Department of Energy Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada of July, 1999

These written comments on the Yucca Mountain draft EIS extend verbal comments I gave at the 1/20/2000 St. Louis DOE hearing that focused on the transportation aspects of the draft statement. I am a registered voter in the City of St. Louis, MO where I have resided continuously since 1974. I am employed as a faculty pathologist and an Associate Professor of Pathology at Washington University in the School of Medicine in St. Louis. I am licensed to practice medicine and surgery in MO (R-5821) and have been so since 1974.

My general comments in sections 1-5 address Volume I, sections 2.1.1.3 and 2.1.1.4 and Volume II, Appendix J, of the draft EIS. I would like to make the following points:

1 1. The absolute most compelling reason why I favor the NO ACTION option is that I, as a citizen should not have to bear additional costs to transport and store at Yucca Mountain NV commercial nuclear power plant wastes. These costs could easily have been anticipated and budgeted for by the industry. It seems that having the spent fuel rods kept on site in relatively small amounts (compared to concentrating everything at Yucca Mountain), where they can be monitored, makes good sense. I believe there was a rush to judgment by Congress, probably based on nuclear power industry and governmental agency lobbying, for the central U.S. site.

2 2. Regarding costs: I note that one international option being considered is to establish a commercial nuclear waste storage deposit in the Australian outback, a project that might generate as much as $5 billion in revenue. It certainly seems fair that the nuclear power industry should be charged a hefty fee for the storage of their nuclear waste if the Yucca Mountain Action is enacted.

Sections 2.1.5 on page 2-58 and 2.2.3 on page 2-67 of Volume 1 deal with projected costs of the action and no-action options:

Section 2.1.5 is one short paragraph to justify a staggering $28.8 billion cost! The section gives no rationale supporting the validity of the data except a study by TRW, a biased DOE contractor. DOE should at least assure the public the cost figures have some validity and reliability through cross-referencing other cost estimates and sources of this type of data. Instead, there is no analysis of the costs - shouldn't data from several sources have been considered and analyzed in the report itself? The brevity of this critical section is ludicrous and invites incredulity that this data represents reality. This section is unacceptable as it stands and needs to be dramatically expanded. The paragraph needs to address who pays for Yucca Mountain in clear English, if it is the taxpayer, say so. The draft EIS should state explicitly how much of the Yucca Mountain bill and transportation costs taxpayers, industry and federal agencies will pay.

Section 2.2.3 dealing with the costs of the no-action alternative is one paragraph 10.5 lines long and indicates the cost of the no-action alternative is 2-30 times higher but, again, no rationale or cost justification is given. In short sections 2.1.5 and 2.2.3 are worthless and should be

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completely revised and presented in a more responsible format where the cost-sharing formula is presented.

3 3. The Public comment period which will expire Feb 9, 2000 should be extended at least another 6 months, preferably 12, to give the public sufficient time to digest the more than 1600 page highly technical draft EIS document. At the hearing I understood that 2,000 copies had been distributed; this is an inadequate number considering the gravity of the options the public is being asked to weigh. If the draft was ready in July of 1999, why was the St. Louis hearing not held until January 20, 2000? My copy of the draft EIS reached me only 7 days prior to the deadline. Also at the meeting a DOE spokesperson stated that copies of the draft EIS "were supposed to be here at the meeting" (a reasonable expectation if the purpose of the meeting were to hear from a truly informed public) but were not; no explanation was offered why not. This is a serious problem that tends to make the public suspicious that DOE information is not readily forthcoming.

4 4. The need to subject citizens to potentially hazardous nuclear spent fuel and high level wastes with every-other-day rail and truck shipments for 30 *years* through metro St. Louis is completely unacceptable. I was happy to hear such a strong condemnation of the plan and a clear call FOR the NO ACTION alternative by Congressman William Clay and by all but one of 55 citizens of St. Louis MO and East St Louis IL, all of whom were at some risk of nuclear exposure if atmospheric releases occurred. Many of the people opposing the plan lived near the railroad tracks. The testimony of the families with small children who expressed fear of a nuclear accident were particularly compelling - why should it be necessary to subject children to such concerns? My conviction that the NO ACTION option must be adopted grew stronger as the hearing progressed

5 5. The data which was presented at the Jan 20 hearing of the frequent railway accidents that occur in the St. Louis area, that the geologic formations at Yucca Mountain permit rapid passage of water into the underlying aquifer 800 feet below, and that the Yucca Mountain region is seismologically unstable are reasons enough to doubt this is a viable place to store the equivalent of 2,500 nuclear
15 bombs. In addition, the draft EIS raises an additional unaddressed concern that was not mentioned at the hearing. That is, that (a) nearby Nellis Air force base supersonic jets could contribute to seismic instability at Yucca Mountain, and (b) by simple deduction, that a damaged jet, after the pilot ejects, could crash into Yucca Mountain posing another realistic threat to the nuclear stores. This could occur either immediately, through transmitted shock at impact of the jet into the mountain, or after a delay period through cracks in the rocks the permit increased seepage of radioactive gases to the atmosphere or underground water supply. Or conceivably, transmitted shock if severe enough could possibly damage some of the nuclear containment casks.

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6 6. My *current review* of the draft EIS focuses on my area of expertise as a physician and pathologist, that is, on possible effects of an accident at the Yucca Mountain repository and of the impact of the transportation plan with inevitable rail and truck accidents on human health. The time allotted does not permit making more than a few comments. The key point I would like to make is that many of the analyses in APPENDIX F are superficial, that is they lack scientific rigor, which I feel is completely inexcusable, since after all, damage to people is arguably more important than damage to the environment, although of course both are important.

16 For example I found the elementary primer on radiation to be perfunctory and simplistic (although the facts were true in general) and missed the point. The primer and the analysis could and should have addressed all of the many *proven* adverse effects of radiation on human cells and tissues, not just cancer alone which is the tip of the medical iceberg. In the case of inhalation exposure, for example, pulmonary fibrosis and emphysema as well as cancer should have been

addressed. Radiation biology is far more advanced than the draft EIS would indicate. No where is mentioned, as another example, that radiation can damage and kill cells by *apoptosis* without damaging nucleic acids. Whole sections of current radiation biology scientific journals are devoted to this topic alone. I got the impression that physicians knowledgeable about human radiation pathologic effects probably had no part in writing this document. I find this to be a very disappointing oversight if one's intent were to accurately analyze possibly adverse scenarios of an accident while transporting high-level and spent nuclear fuels.

7 There also should be detailed information given on the number of actual rail accidents, actual injuries to people and property, and actual data on radioactive releases from transport accidents. It is telling that some public commentators gave far more detailed information of this type than appeared in the draft EIS. I had the impression reading the narrative that the writers had done this type of document many times before and were merely plugging in "boiler-plate" language that had passed agency scrutiny in the past.

7. APPENDIX F.2 specific concerns and comments:

8 a) Page F-4. I challenge the validity of the statement "cancer is the principal potential risk to human health from exposure to low or chronic levels of radiation. Pulmonary fibrosis, for example, is not cancer yet this is one of the chief thoroughly documented, scientifically and medically uncontested adverse effects of radiation exposure on uranium miners. These oversimplifications and inaccuracies again cast doubt on the competence of the people who prepared this section of the draft EIS statement. The section needs more work, even as a basic primer.

9 b) Page F-11. The worker dosage analysis at Yucca Mountain makes the incorrect implicit assumption that workers are only exposed during the Yucca Mountain project. However, most of the permanent workers spend their full working lifetimes at nuclear sites and thus their probable lifetime exposures including the intervals of their lives before and after being employed at Yucca Mountain need to be factored into the risk estimates. The "double hit" hypothesis of cancerogenesis is now conclusively established. Thus, a worker could have suffered the initial hit at another nuclear site, and then get the critical second hit that leads to cancer formation at Yucca Mountain. Exposure and employment data should be readily available on Yucca Mountain workers. My guess would be that many have large cumulative radiation exposures that already increase their risk for cancers and other subthreshold radiation injuries.

10 b) Page F-12. How was the factor of 0.0004 latent cancer fatality per rem validated and derived? A source is given, but a brief rationale should be stated explicitly in the draft EIS. The secondary documents cannot be obtained in time to comment by Feb 9. The statements are made that consideration of other "non-fatal cancers and severe genetic effects" of radiation exposure that "increases the total change by a factor of 1.5 to 5 compared to the change for latent cancer fatalities" is data that "as is the general practice for any DOE EIS, estimates of the total change were not included in the Yucca Mountain EIS." This policy should be reconsidered; it is absurd. *Why this policy is justifiable* scientifically needs to be stated explicitly. To this physician, the policy misleads the public as to the actual danger of radiation exposure—does DOE believe death is the only legitimate concern of the public? I think not.

11 c) The CAIRS database datasets are mentioned on pages F-15 and F-16 but the draft EIS does not state how or if the public has access to these data in a similar manner to its access to the EPA's Internet-access CEDR database. This information should be footnoted in the EIS.

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8. APPENDIX H (analytical methods and results)

12 a) On page H-28 there is a ridiculous assumption in the second paragraph that if a cask were breached, a worker would within 10 seconds "immediately vacate the area after observing that the cask had ruptured" implies cask rupture "out of the blue." While possible, it seems much more likely that cask breaching will be more likely occur during a major accident in which it seems likely, or certainly possible, the worker will also be injured and not be able to escape to safety immediately. In this scenario, safety may be a long way away! Again, such simplistic assumptions cast doubt on the seriousness and medical competence of the people who prepared this draft document. I feel compelled to use such language because the assumptions insult my intelligence and this is very serious business indeed.

13 b) Page H-31. I challenge the statement that 3,500 drums of solid hazardous wastes and 1,700 gallons of hazardous liquid wastes "would pose a very small potential for accidental releases and exposures of workers" defies common sense. These barrels in time all leak, so I would say the potential is almost 100% that some leakage will occur and therefore the risk is proportional to how many barrels degrade how quickly and what they contain. There is a lot of data on these points at Superfund and FUSRAP sites, so why not be more specific and include some meaningful data here. Because these barrels might leak into the Yucca Mountain aquifer, the public and workers and soldiers at Nellis *would be* at significant risk.

14 9. APPENDIX I (Environmental consequences of long-term repository performance), page I-25, section 1.3.3.

I am aware of the data in NRC NUREG-2907 regarding routine radionuclide airborne and liquid releases from commercial nuclear power plants that generate 90% of the wastes targeted for Yucca Mountain. That compilation documents dozens of reportable radionuclides and noble gases that nuclear reactors and their fuel generate. It is known by everyone in the industry that tritium passes through nuclear fuel cladding. Why wasn't tritium included in the analysis in this section? Thus, I find the statement that "the only radionuclide that would have a relatively large inventory and a potential for gas transport would be C-14" to be ridiculous and very inaccurate. What does a statement like "relatively large inventory" signify, relative to what? To most of the public, the inventory is *monstrous* compared to any other nuclear repository in the world. This too brief paragraph needs to be rewritten to reflect the true facts.

-END OF COMMENTS-

Respectfully Submitted,

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